

Adolescent Immunizations: Give It a Shot!

Amy B. Middleman, MD, MEd, MPH

Professor of Pediatrics

University of Oklahoma Health Sciences Center

Learning Objectives

After the session, learners will be able to:

- Restate the current Advisory Committee on Immunization Practices (ACIP) recommendations for adolescent vaccines
- Explain the benefits of adolescent vaccines
- Implement one new strategy to improve adolescent vaccination rates in the office

The Immunization Schedule: New Recommendation Highlights

ACIP Adolescent Immunization Schedule

("Adolescent Platform")

Vaccines	11-12 yrs	13-15 yrs	16-18 yrs
HPV	2-dose series		3-dose series
Tdap	1 dose		
MCV4	1 st dose		booster
Influenza	Annual immunization		
MenB			



Range of recommended ages for all children



Range of recommended ages for catch-up immunization



Range of recommended ages for immunization of those at high risk

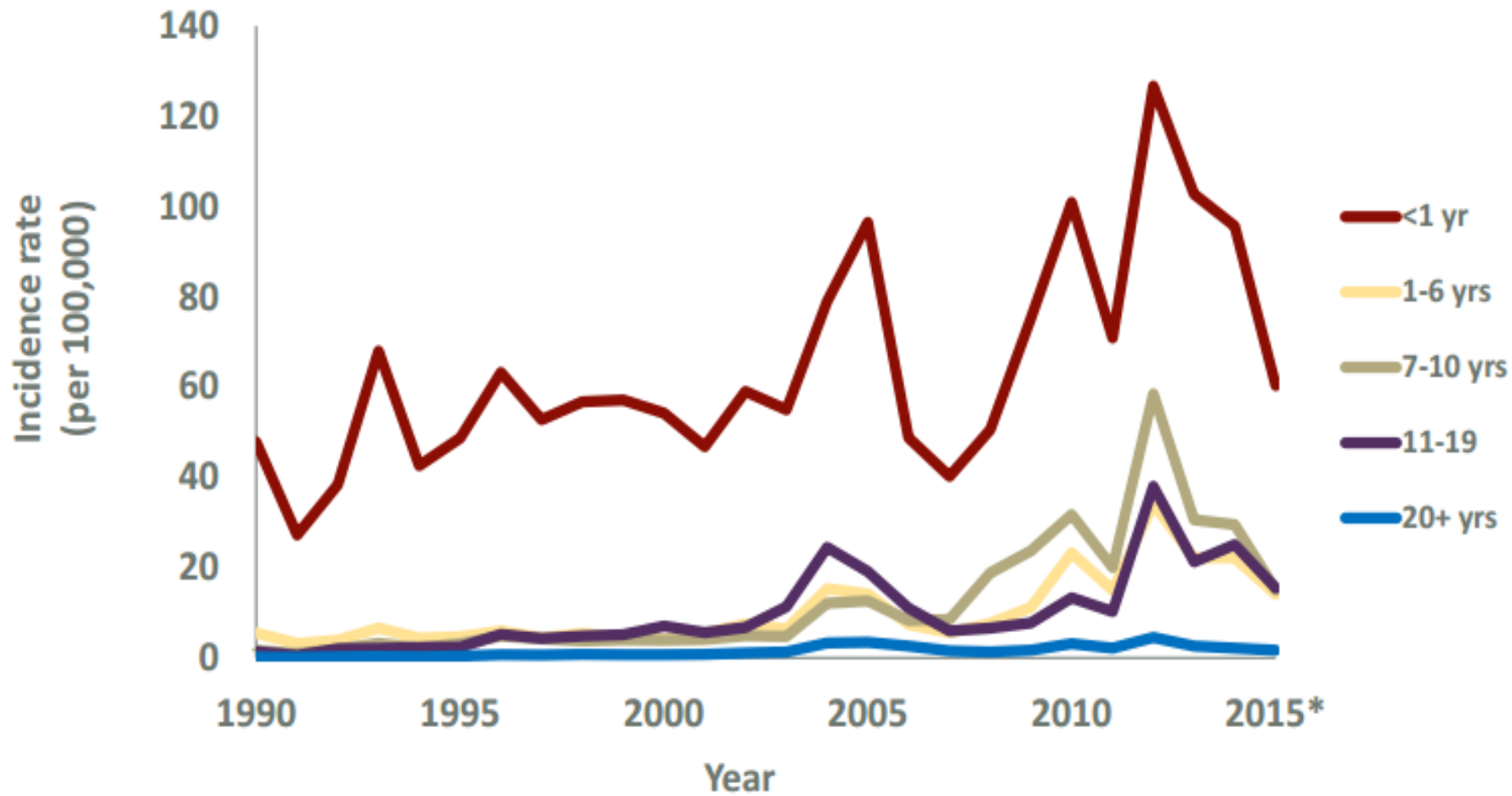


Range of recommended ages for immunization among those desiring immunization

Tdap

- ▶ Routinely recommended for those 11–18 yr of age, preferred age 11–12 yr
- ▶ For those 7–10 yr not fully vaccinated, first dose of any catch-up vaccines to be Tdap
- ▶ A person 19 yr or older who has not received Tdap should receive one dose
- ▶ Tdap should be administered to pregnant women with each pregnancy between weeks 27 and 36 gestation
- ▶ Tdap for new mothers not previously immunized

Reported pertussis incidence by age group: 1990-2015*



*2015 data are provisional

SOURCE: CDC, National Notifiable Diseases Surveillance System and Supplemental Pertussis Surveillance System

Presented at ACIP, CDC, Atlanta, GA. October 19, 2016

Tdap Efficacy

Year after Tdap Vaccination	Tdap Vaccine Efficacy (95% CI)
Year 1	68.8 (59.7, 75.9)
Year 2	56.9 (41.3, 68.4)
Year 3	25.2 (−4.3, 46.4)
Year 4	8.9 (−30.6, 36.4)

Analysis included 1207 pertussis cases among 279,493 persons:
792,418 person years from Jan. 2006 to March 2015.
All subjects had received exclusively DTaP in infancy/childhood.

Infant Cord Blood Geometric Mean Concentrations (GMC) by Gestational Age at Maternal Tdap

	Gestational wk			
	Tdap received	No.	Anti-PT GMC* (95% CI)	Anti-FHA GMC* (95% CI)
	13-16	26	44.2 (32.2–60.7)	297.9 (206.7–429.4)
	17-21	42	53.1 (37.2–75.7)	267.3 (205.4–347.9)
	22-25	54	68.3 (52.8–88.3)	291.8 (222.8–382.2)
ACIP Guidance: 27–36 wks	26-29	30	70.3 (49.0–100.8)	376.8 (257.0–552.7)
	30-33	16	74.9 (38.3–146.4)	417.3 (232.7–748.4)
	34-36	72	32.7 (24.1–44.3)	173.0 (126.5–236.6)
	37-38	74	25.1 (17.9–35.3)	92.7 (69.0–124.7)
	39-41	21	9.0 (5.0–16.2)	31.0 (16.9–56.6)

* Enzyme-linked immunosorbent assay units (EU)/mL

Table 3 from Eberhardt et al. Maternal Immunization Earlier in Pregnancy Maximizes Antibody Transfer and Expected Infant Seropositivity Against Pertussis. CID 2016. (Switzerland)

From ACIP meeting, CDC, Atlanta, GA, October 19, 2016

Vaccine Effectiveness: Infants

- ▶ 148,981 infants Kaiser Permanente Northern California – 2010 to 2015
- ▶ Effectiveness of maternal Tdap vaccination
 - During the first 2 months of life – 91.4%
 - During the first year of life – 69.0% (adjusting for the DTaP series)

HPV Vaccine Recommendation

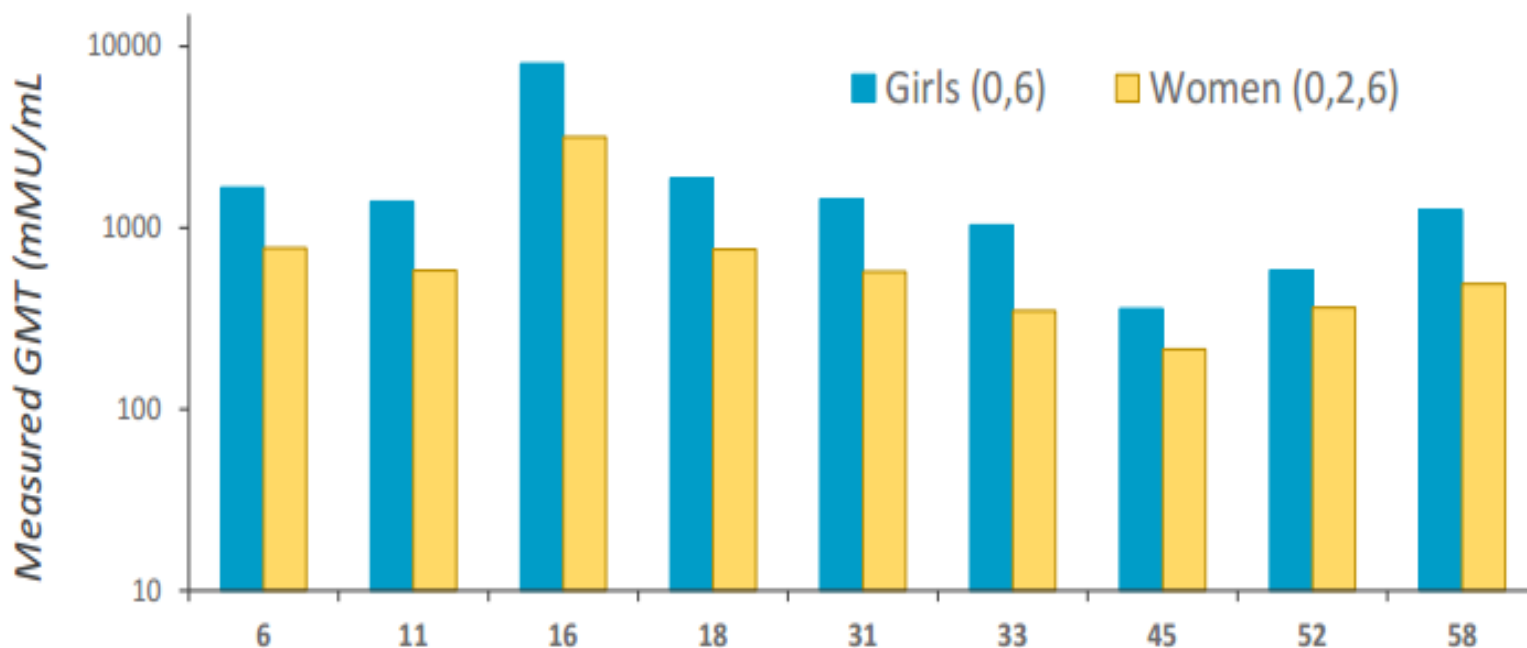
- ▶ All males and females age 11–12 years should receive a 2–dose series (0, 6–12 months). The series can start at age 9 yr.
- ▶ For those initiating the series on or after the 15th birthday or those with immunocompromise, a 3–dose series is indicated (0, 1–2, 6 months)
- ▶ Those with a history of sexual abuse should initiate the series at age 9 yr.
- ▶ Administer to all females who have not received vaccination to age 26 yr; males through age 21 or 26 years.

Vaccine Efficacy: NHANES Data on HPV DNA Prevalence 2003–2006 Versus 2009–2012

Subject Age	4vHPV Prevalence 2003–2006	4vHPV Prevalence 2009–2012
14–19 yrs of age	11.5%	4.3%
20–24 yrs of age	18.5%	12.1%

9vHPV 2-Dose Immunogenicity Trial

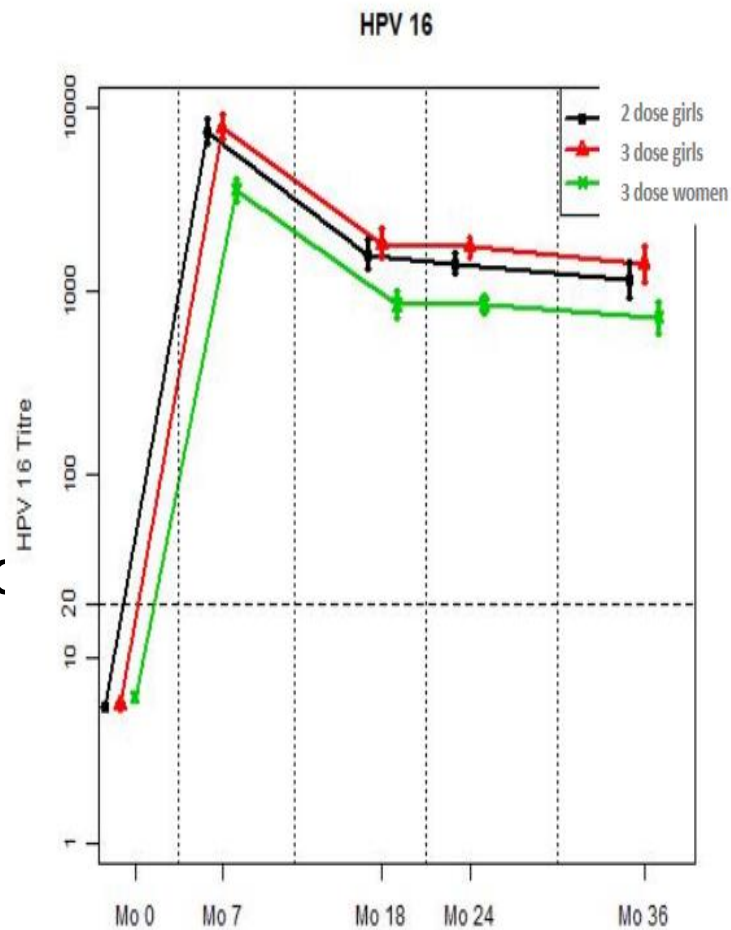
Non-inferior GMT at 1 month post-last dose in
2-dose girls vs. 3-dose women



Fold difference (girls/women)	2.15	2.39	2.54	2.46	2.51	2.96	1.67	1.60	2.55
95% CI	(1.83, 2.53)	(2.03, 2.82)	(2.14, 3.00)	(2.05, 2.96)	(2.10, 3.00)	(2.50, 3.50)	(1.38, 2.03)	(1.36, 1.87)	(2.15, 3.01)

4vHPV 2- versus 3-Dose Immunogenicity Trial

- ▶ Follow-up through month 36
 - 2 doses (0, 6 months) in 9 to 13 year olds
 - 3 doses (0, 2, 6 months) in 9 to 13 year olds
 - 3 doses (0, 1, 6 months) in 16 to 26 year olds
- ▶ Antibody kinetics similar in 3 groups



Dashed line is serostatus cut-off
Antibody measured by cLIA.

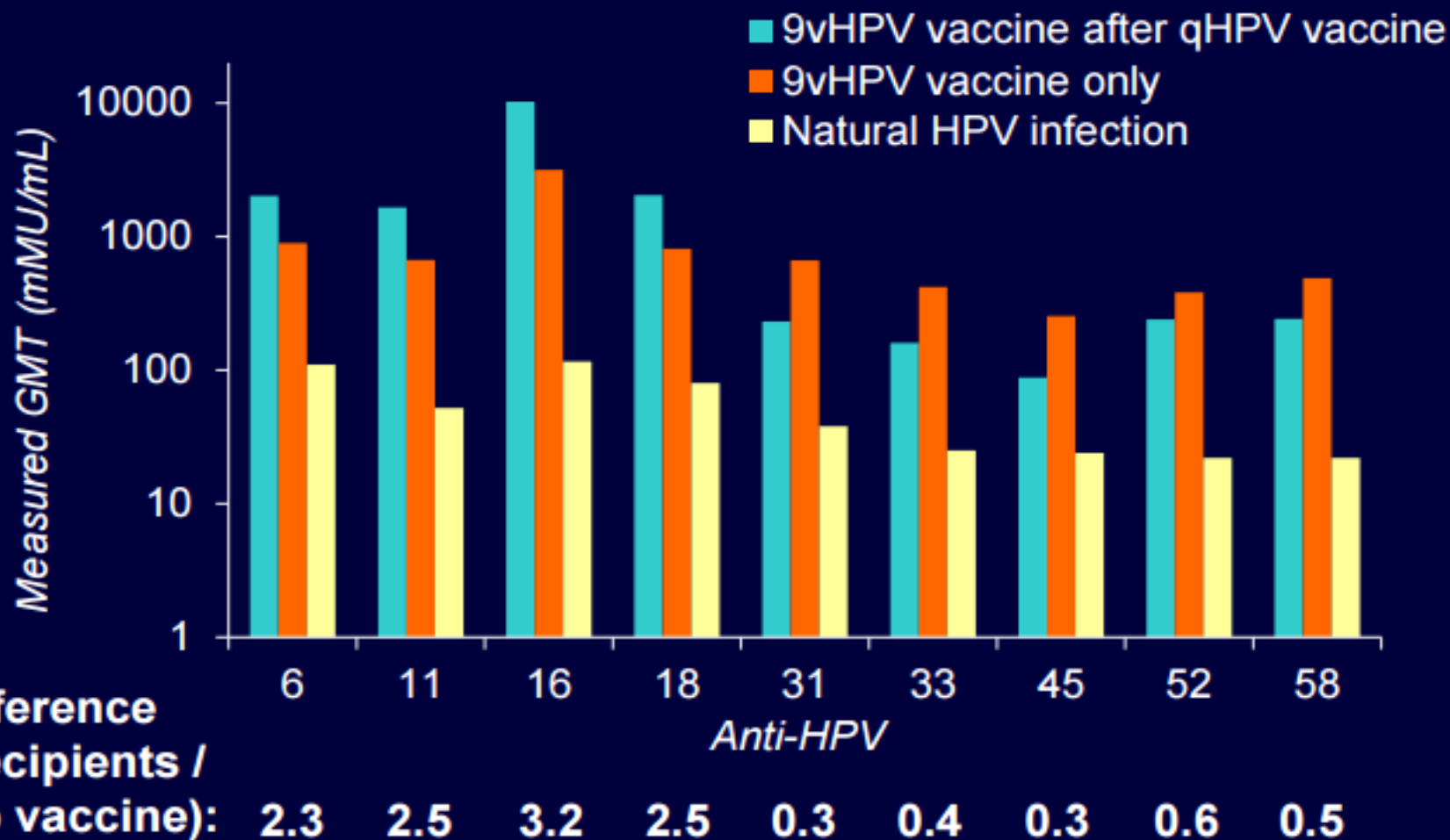
Adapted from Dobson SR, et al. *JAMA*. 2013;309(17):1793–1802.

Markowitz L. Presented at ACIP October 2016 Meeting.

<https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2016-10/hpv-02-markowitz-oct-2016.pdf>

Cross-Study Immunogenicity Comparison: 9vHPV Vaccine Immunogenicity in Prior GARDASIL® Recipients vs. Subjects Naïve to HPV Vaccination

Month 7 cLIA GMT in young women, 16 to 26 years of age



Luxembourg A. Presented at ACIP February 2016 Meeting.

Available at: <https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2016-02/hpv-03-luxembourg.pdf>

<http://www.cdc.gov/hpv/downloads/9vHPV-guidance.pdf>

Information for persons who previously completed a three-dose or two-dose HPV vaccination series

Is additional vaccination with 9vHPV recommended for persons who have completed a three-dose or two-dose series of either 4vHPV or 2vHPV?

- There is no ACIP recommendation for additional 9vHPV doses for persons who previously completed a series of 4vHPV or 2vHPV.

If a person desires protection against the five additional types prevented by 9vHPV and has completed a series of 4vHPV, what issues should be considered?

- The majority of all HPV-associated cancers that can be prevented by vaccination are caused by HPV 16 or 18. These HPV types are prevented by all three HPV vaccines: 2vHPV, 4vHPV and 9vHPV.
- The benefit of protection against the five additional types targeted by 9vHPV would be mostly limited to females for prevention of cervical cancers and precancers. This is because only a small percentage of HPV-associated cancers in males is due to the five additional types prevented by 9vHPV.
- Available data show no serious safety concerns in persons who were vaccinated with 9vHPV after having received three doses of 4vHPV.
- Cervical cancer screening is recommended beginning at age 21 years and continuing through age 65 years for both vaccinated and unvaccinated women.⁵

HPV Products



- ▶ 4vHPV no longer available in the United States
- ▶ 2vHPV no longer available in the United States
- ▶ 9vHPV is the only product available in the United States
- ▶ HPV vaccine received now in the United States is 9vHPV

Recommendations for Use of MenACWY

- ▶ **Routinely recommended:**
 - Adolescents age 11–12 yrs; booster dose age 16 yrs
 - For those receiving the first dose at age 16 years or older, a booster dose is not required
 - Routine vaccination not recommended after age 21 years
 - Provide 2-dose primary series to those at higher risk
- ▶ **High-risk persons age 2 months through 55 yrs**
 - Complement deficiency (including Eculizumab® users)
 - Functional / anatomic asplenia
 - HIV infection
 - Microbiologists routinely exposed; military recruits
 - Outbreak response
 - Appropriate dosing for those 2 months to 2 yrs
 - Boosting: q 3 yrs under age 7 yrs; q 5 yrs thereafter

Decreasing Incidence of Serogroup C, W, Y Meningococcal Disease in 11–19 Year Olds

Year	Incidence per 100,000 (95% confidence intervals) ¹		
	<1 year	11–19 years	≥20 years
2004-2005	0.77 (0.33, 1.55)	0.27 (0.17, 0.39)	0.17 (0.14, 0.21)
2006-2007	1.20 (0.61, 2.11)	0.31 (0.21, 0.45)	0.23 (0.19, 0.28)
2008-2009	0.93 (0.48, 1.69)	0.15 (0.08, 0.26)	0.23 (0.19, 0.27)
2010-2011	1.37 (0.74, 2.33)	0.05 (0.02, 0.12)	0.14 (0.11, 0.18)
2012-2013	0.74 (0.39, 1.32)	0.05 (0.02, 0.10)	0.12 (0.10, 0.15)

- 80% decrease in serogroup C, W, Y meningococcal disease among 11–19 year olds

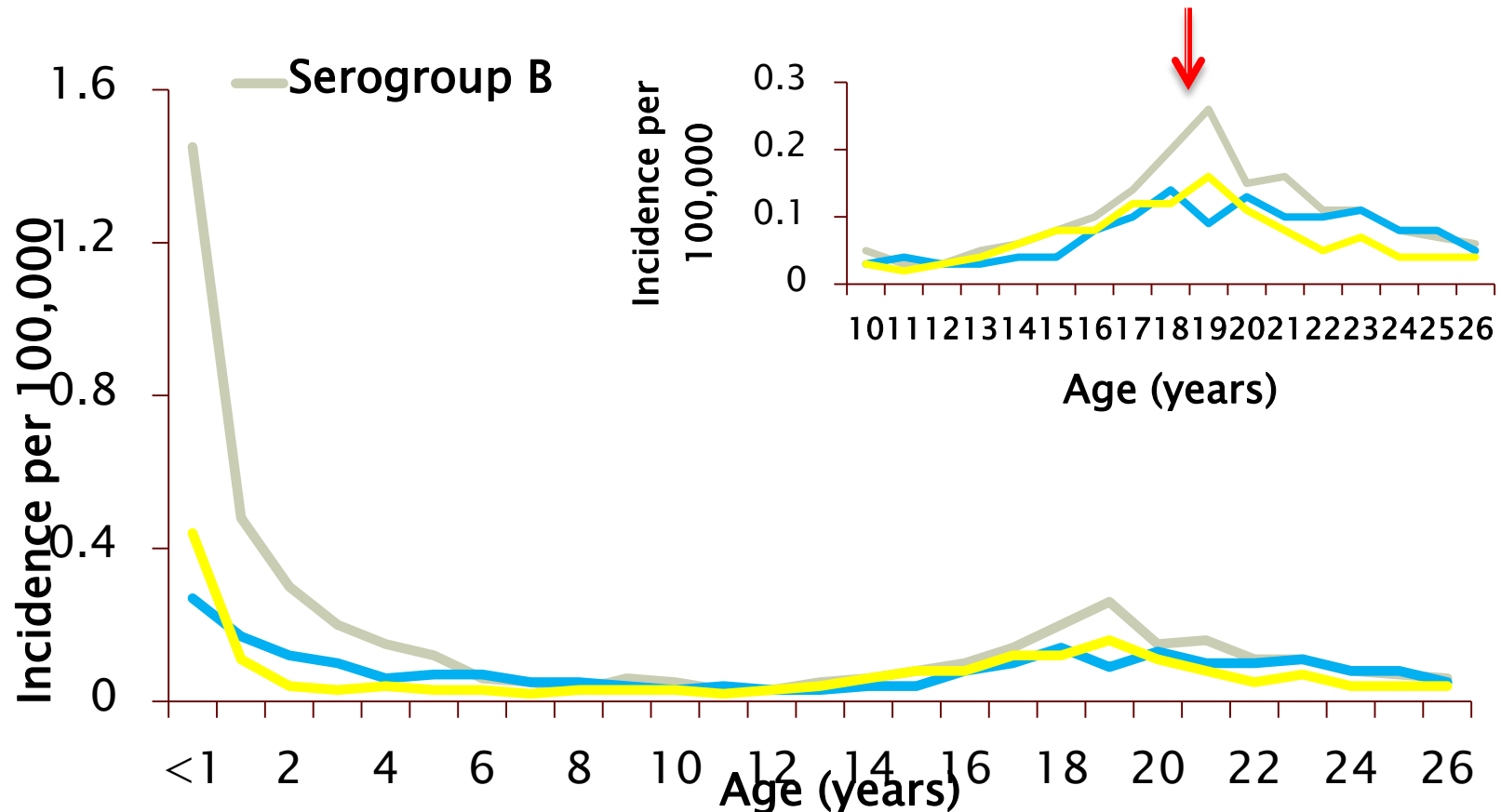
¹Source: Active Bacterial Core surveillance (ABCs) cases from 2004-2013 estimated to the U.S. population with 18% correction for nonculture confirmed cases. In 2010, estimated case counts from ABCs were lower than cases reported to the National Notifiable Diseases Surveillance System (NNDSS) and might not be representative.

Annual Burden of Disease for 11–24 Year Olds

	CASES	DEATHS	SEQUELAE
Serogroup B*	54–67	5–10	5–13
Serogroup C & Y	62–77	6–12	6–15

*Majority (80%) of serogroup B cases occurred among those 16–24 years of age.

Incidence of Meningococcal Disease by Age and Serogroup, United States, 2005-2012*



* Source: National Notifiable Diseases Surveillance System (NNSS) with additional serogroup data provided

by state and local health departments

Recommendations for Use of Meningococcal Serogroup B Vaccines*

- Routinely recommended for high-risk persons age 10 years and older
 - Complement deficiency (including Eculizumab® users)
 - Functional / anatomic asplenia
 - Microbiologists routinely exposed
 - Outbreak response
 - No preference among vaccine products
- Grade B (permissive) recommendation
 - May be given to 16-23 yr old to prevent disease; preferred age is 16-18 yr of age
 - May be given with other adolescent vaccines
 - No preference; start and complete using same product

* Approved at the February 26, 2015 and June, 2015 ACIP Meetings

MenB Vaccines

Product	FDA License	Antigens	Dose Schedule	Immuno-genicity*
Trumenba® (Pfizer)	Oct. 29, 2014 10–25 yr olds	2 components: fHbp subfamily A/v2,3; subfamily B/v1	0, 2, 6 months for high risk; 0, 6 months for healthy adolescents	86–99% achieve protective titer (US adol./ young adults) [~95% strain]
Bexsero® (Novartis)	Jan. 23, 2015 10–25 yr olds	4 components: fHbp subfamily B/v1; Nhba; NadA; Por A1.4	0, 1 month	73–93% achieve protective titer (US/Polish adol./young adults) [~91% strain]

*Data not directly comparable between products; no data currently available for specific risk groups

One Comment About Safety...

American Academy of Pediatrics Emphasizes Safety and Importance of Vaccines

1/10/2017

*by: Fernando Stein, MD, FAAP, President, American Academy of Pediatrics, and
Karen Remley, MD, MBA, MPH, FAAP, CEO/Executive Vice President, American
Academy of Pediatrics*

In response to news reports today suggesting a possible new federal commission on immunizations, the American Academy of Pediatrics reiterates that vaccines protect children's health and save lives. They prevent life-threatening diseases, including forms of cancer. Vaccines have been part of the fabric of our society for decades and are the most significant medical innovation of our time.

Vaccines are safe. Vaccines are effective. Vaccines save lives.

Claims that vaccines are linked to autism, or are unsafe when administered according to the recommended schedule, have been disproven by a robust body of medical literature. Delaying vaccines only leaves a child at risk of disease. Vaccines keep communities healthy, and protect some of the most vulnerable in our society, including the elderly, and children who are too young to be vaccinated or have compromised immune systems.

Pediatricians partner with parents to provide the best care for their children, and what is best for children is to be fully vaccinated. We stand ready to work with the White House and the federal government to share the extensive scientific evidence demonstrating the safety of vaccines, including the recommended schedule.

The Childhood **IMMUNIZATION SCHEDULE** and Safety

**STAKEHOLDER CONCERNS, SCIENTIFIC
EVIDENCE, AND FUTURE STUDIES**

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

Importance of High Coverage Rates

- ▶ Vaccination protects individuals from disease.
- ▶ When vaccination rates are low, disease outbreaks occur.
- ▶ High vaccination rates protect those who cannot receive/do not respond to vaccination.

NIS-Teen Coverage Results

(%)

Vaccine	2008	2009	2010	2011	2012	2013	2014	2015
Tdap after 10 yrs	40.8	55.6	68.7	78.2	84.6	86.0	87.6	86.4
≥3 HepB	87.9	89.9	91.6	92.3	92.8	93.2	91.4	91.1
≥2 MMR	89.3	89.1	90.5	91.1	91.4	91.8	90.7	90.7
≥2 Varicella (no dz hx)	34.1	48.6	58.1	68.3	74.9	78.5	81.0	83.1
≥1 MCV4	41.8	53.6	62.7	70.5	74.0	77.8	79.3	81.3
≥2 MCV4 (17 yr)							28.5	33.3
≥1 HPV	37.2 (17.9)	44.3 (26.7)	48.7 (32.0)	53.0 (34.8)	53.8 (33.4)	57.3 (37.6)	60.0 (39.7)	62.8 (41.9)
Among Males			1.4	8.3	20.8	34.6	41.7 (21.6)	49.8 (28.1)

How to Improve Vaccination Rates: Policy Updates

16-year Platform

- ▶ CDC has highlighted a 16 year column in the 2017 Immunization Schedule

Figure 1. Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger—United States, 2017.

(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE [FIGURE 2]).

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded in gray.

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19-23 mos	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13-15 yrs	16 yrs	17-18 yrs
Hepatitis B ¹ (HepB)	1 st dose	2 nd dose															

- ▶ SAHM –published in April, 2017: “SAHM supports the establishment of a **16-year-old immunization platform** to ensure completion of all recommended vaccines, which has the added value of providing an opportunity for developmentally-appropriate adolescent health services.”

Current State Legislation

Secondary School Vaccination requirements through 2016-2017*

Tdap: 47 states (+ DC)

MCV4: 26 states (+ DC)

HPV: 2 states (VA, RI) (+ DC)

*as of January, 2017, IAC

School Requirements Significantly Affect Coverage Rates – 2010 NIS-Teen Data (13-17 year olds)

Vaccine	Vaccination requirement		Education Requirement		No Requirements	
≥1 MCV4	3	(70.5)	10	(51.0)	38	(53.4)
≥1 Td/Tdap	32	(79.8)	--	--	19	(69.5)
≥1 HPV	--	--	6**	(45.0)	45	(44.2)

Red font indicates significantly lower ($p < 0.05$) coverage compared to states with vaccine requirements.

*Status based on requirements for the 2008-2009 School Year

**Because of small sample size, one state with a vaccine requirement is included with the states with education only requirements.

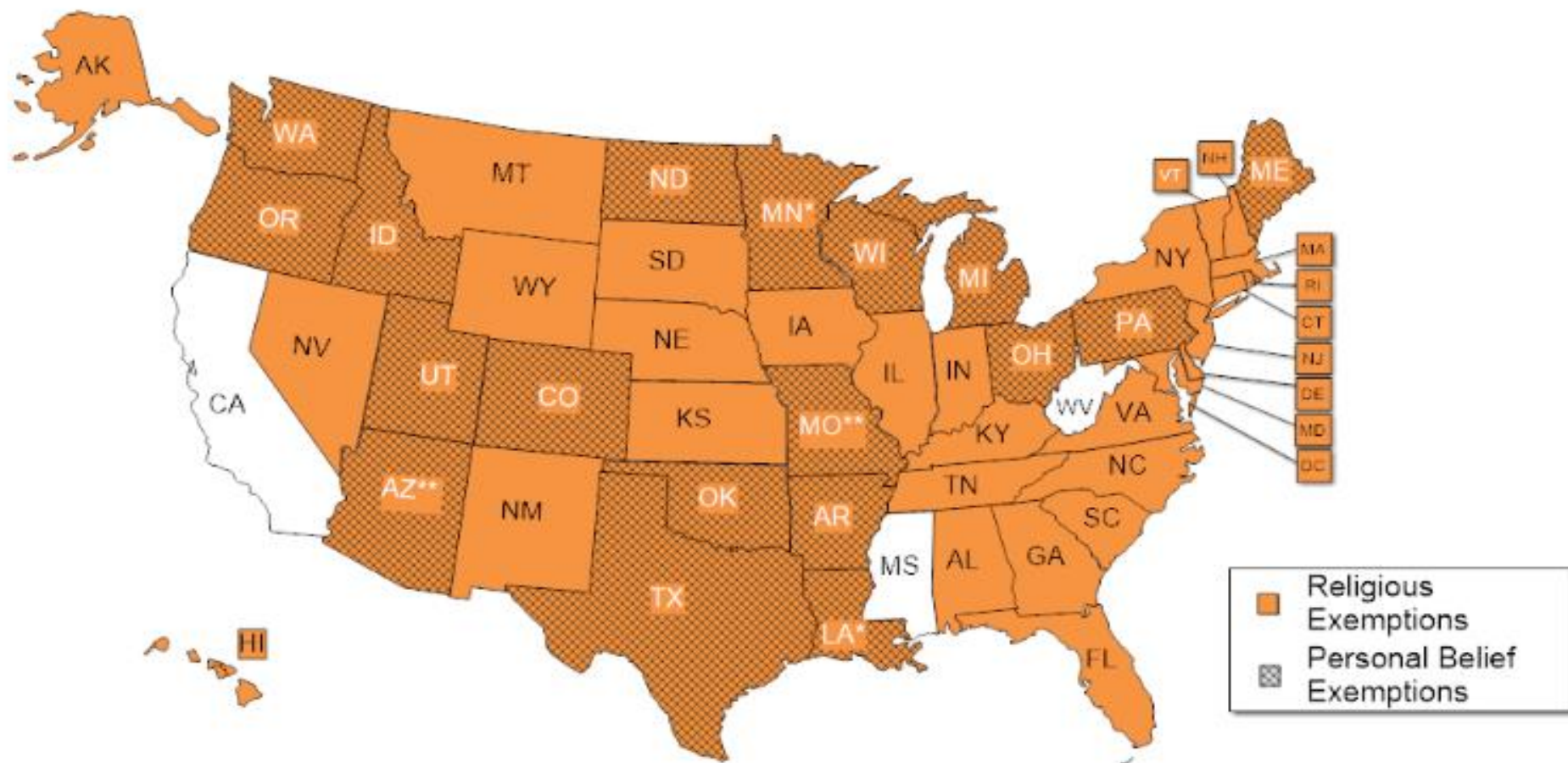
Opt-Outs



- ▶ Personal belief exemptions have been increasing since 2000
- ▶ Greater increase in personal belief versus religious exemptions
- ▶ Easier exemptions associated with increased rates of pertussis
- ▶ Nonmedical exemptions cluster geographically
- ▶ Outbreaks of measles/Hib associated with personal belief exemptions

Omer SB et al. JAMA, 2006;296:1757
Thompson JW et al. Am J Prev Med, 2007;32(3):194.
Atwell et al. Pediatrics 2013; 132:624.
Varun K et al. JAMA. 2016;315(11):1149-1158

State Non-Medical Exemptions from School Immunization Requirements, 2016



Source: Adapted from Immunization Action Coalition, June 2014.

* The existing statute in Minnesota and Louisiana does not explicitly recognize religion as a reason for claiming an exemption, however, as a practical matter, the non-medical exemption may encompass religious beliefs.

** In Arizona, the personal exemption is for school enrollees. In Missouri, it is for childcare enrollees only.

AAP Policy Statement: August 29, 2016

Medical Versus Nonmedical Immunization Exemptions for Child Care and School Attendance

COMMITTEE ON PRACTICE AND AMBULATORY MEDICINE, COMMITTEE ON INFECTIOUS DISEASES, COMMITTEE ON STATE
GOVERNMENT AFFAIRS, COUNCIL ON SCHOOL HEALTH, SECTION ON ADMINISTRATION AND PRACTICE MANAGEMENT

otherwise required for child care and school attendance. The American Academy of Pediatrics (AAP) supports regulations and laws requiring certification of immunization to attend child care and school as a sound means of providing a safe environment for attendees and employees of these settings. The AAP also supports medically indicated exemptions to specific immunizations as determined for each individual child. The AAP views nonmedical exemptions to school-required immunizations as inappropriate for individual, public health, and ethical reasons and advocates for their elimination.

How to Improve Vaccination Rates: Provider

Adolescents Access Preventive Care

National Survey	Adolescents (10 through 17 years): Percent (95% CI) who accessed preventive services in the past 12 months
2011 National Health Interview Survey	74.4 (72.9–75.9)
2011–2012 National Survey of Children's Health	81.2 (80.3–82.1)
2011 Medical Expenditure Panel Survey	43.0 (40.3–45.7)

Provider Recommendation

“...provider recommendation is the strongest predictor of vaccination”

Preteen and Teen Home

For Parents

For Preteens and Teens

For Health Care Professionals

For Partners

Teen Vaccination Coverage

Multimedia Products +

References and Publications

[CDC > Preteen and Teen Home](#)

For Health Care Professionals/Clinicians

[f](#) [t](#) [+](#)

What can you do to ensure your patients get fully vaccinated?

- Give an effective recommendation for preteen vaccines by telling parents their child needs three vaccines **today** to help prevent meningitis, HPV cancers, and pertussis.
- Strongly recommend adolescent vaccines to parents of your 11 through 18 year old patients. Parents trust your opinion more than anyone else's when it comes to immunizations. Studies consistently show that provider recommendation is the strongest predictor of vaccination.
- Use every opportunity to vaccinate your adolescent patients. Ask about vaccination status when they come in for sick visits and sports physicals.
- Patient reminder and recall systems such as automated postcards, phone calls, and text messages are effective tools for increasing office visits.
- Educate parents about the diseases that can be prevented by adolescent vaccines. Parents may know very little about pertussis, meningococcal disease, or HPV.
- Implement standing orders policies so that patients can receive vaccines without a physician examination or individual physician order.

Provider Resources

The following resources about adolescent vaccines include tools that you can use at your practice and share with your staff and colleagues.

[Information for Health Care Professionals about Adolescent Vaccines](#) [4 pages]

Factsheet about adolescent vaccines developed specifically for the doctors, nurses and other health care

Missed Opportunities

Missed Opportunities for HPV Vaccination in Adolescent Girls: A Qualitative Study



WHAT'S KNOWN ON THIS SUBJECT: Rates of human papillomavirus (HPV) vaccination lag behind other adolescent vaccines. Research indicates that provider recommendation is the key to improving HPV vaccination rates and that most adolescents who are unvaccinated received other vaccines, indicating missed opportunities for HPV vaccination.



WHAT THIS STUDY ADDS: This study explores in-depth the content of provider–patient conversations that either create or prevent opportunities for HPV vaccination. Effective and ineffective conversations are presented with the goal of providing practical tools to improve communication regarding HPV vaccines.

AUTHORS: Rebecca B. Perkins, MD, MSc,^a Jack A. Clark, PhD,^{b,c} Gauri Apte, MB, BS, MPH,^c Jessica L. Vercruysse, MA,^a Justen J. Sumner, MD, MPH,^a Constance L. Wall-Haas, DNP, PPCNP-BC,^d Anna W. Rosenquist, MD,^e and Natalie Pierre-Joseph, MD, MPH^a

^a*Boston University School of Medicine, Boston, Massachusetts;*

^b*Edith Nourse Rogers Memorial Veterans Hospital—Bedford, Bedford, Massachusetts;*

^c*Boston University School of Public Health, Boston, Massachusetts;*

^d*Harvard Vanguard Medical Associates, Chelmsford, Massachusetts; and*

^e*Harvard Vanguard Medical Associates, Burlington, Massachusetts*

KEY WORDS

HPV vaccination, missed opportunities, parental attitudes, provider attitudes, qualitative methods

“The most common reason for nonvaccination reported by parents/guardians was never being offered the vaccine (44%); many stated they would have accepted the vaccine if offered...”

Strong Recommendation

Announcement

- Timeliness
- Urgency
- Consistency
- Strength of endorsement

Gilkey MB, et al. *Vaccine*. 2016;34(9):1187–1192; Gilkey MB, et al. *Cancer Epidemiol Biomarkers Prev*. 2015;24(11):1673–1679; McRee AL, et al. *J Pediatr Health Care*. 2014;28(6):541–549; Henrikson NB, et al. *Prev Med Rep*. 2016;4:94–97.
Courtesy of Annie–Laurie McRee.

Announce versus Converse

- ▶ Pediatrics January 2017 (early release)
- ▶ Noel Brewer et al.; HPV vaccine
- ▶ Intervention practices – announced the vaccines and discussed vaccines if needed
- ▶ Conversation practices – discussed vaccines first, recommended HPV vaccine strongly
- ▶ Intervention clinic vaccination rates exceeded controls by 5.4%
- ▶ Conversation clinic vaccination rates same as controls

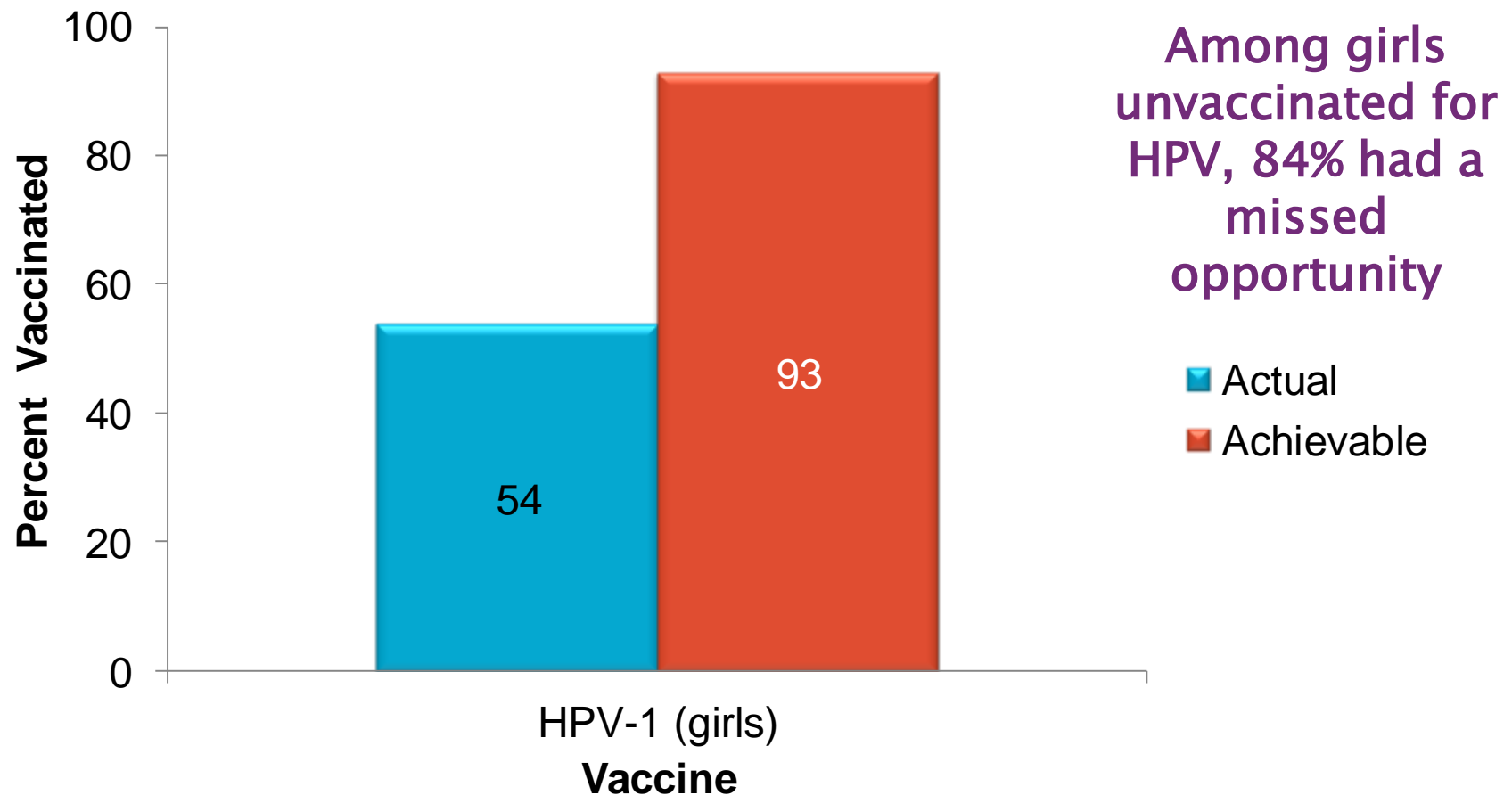


Important Messages for HPV Vaccination



- ▶ It is time to get your adolescent vaccines: Tdap, HPV and meningococcal vaccines...
- ▶ The HPV vaccine PREVENTS CANCER!
- ▶ The immune response is more vigorous and only 2 doses are needed in younger adolescents.
- ▶ Nearly everyone gets the virus at some point in their lifetime.
- ▶ You don't have to have sex to get the virus.
- ▶ I strongly recommend the vaccine – my child(ren)/nieces/nephews had this vaccine.

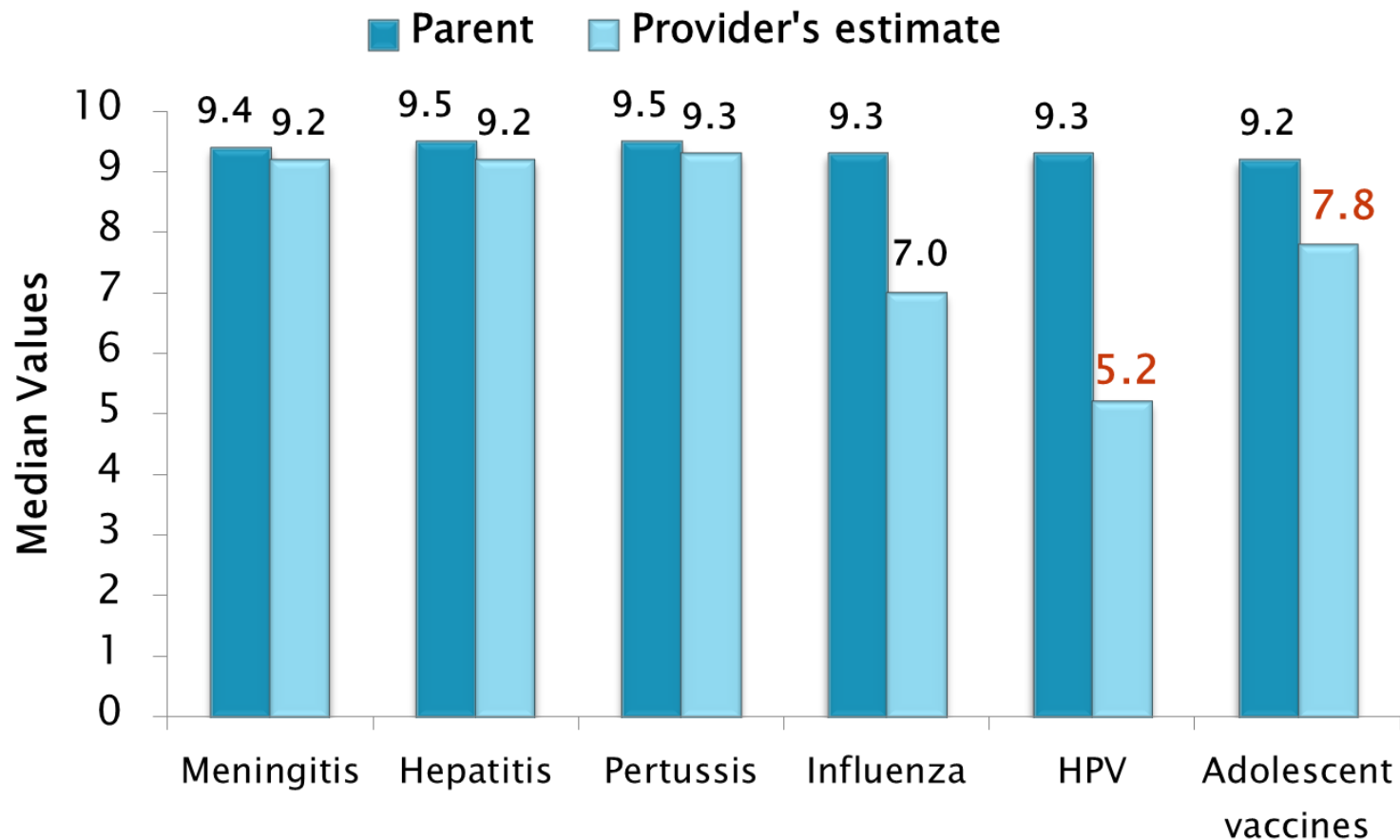
Actual and Achievable Vaccination Coverage if Missed Opportunities Were Eliminated: Adolescents 13–17 Years, NIS–Teen 2012



Missed opportunity: Healthcare encounter when some, but not all ACIP-recommended vaccines are given. HPV-1: Receipt of at least one dose of HPV.

Stokley S, Curtis R, Jeyarajah J. Human Papillomavirus Vaccination Coverage Among Adolescent Girls, 2007–2012, and Postlicensure Vaccine Safety Monitoring, 2006–2013 – United States. MMWR. 62(29);591–595.

Providers underestimate the value parents place on adolescent vaccines



HPV vaccine
is CANCER PREVENTION.
www.cdc.gov/vaccines/teens



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Educate Staff First



Educate office staff about:

- ▶ Importance of simultaneous administration of vaccinations (same day, different anatomic sites)
- ▶ True contraindications to vaccination
- ▶ Best practices (General Immunization Recommendations)
- ▶ Check immunization status of scheduled patients
- ▶ Establish practice immunization goals; AFIX
www.cdc.gov/nip/afix

Other Vaccination Strategies

- ▶ Standing orders
 - Recommended by CDC (strong evidence) to increase adult immunization¹
 - Would likely decrease missed vaccination opportunities in adolescents
- ▶ Vaccination “quick visits”
- ▶ Reminder/recall systems (can be part of IIS)
 - Recommended (strong evidence) by CDC to increase adult, adolescent, and childhood immunizations¹

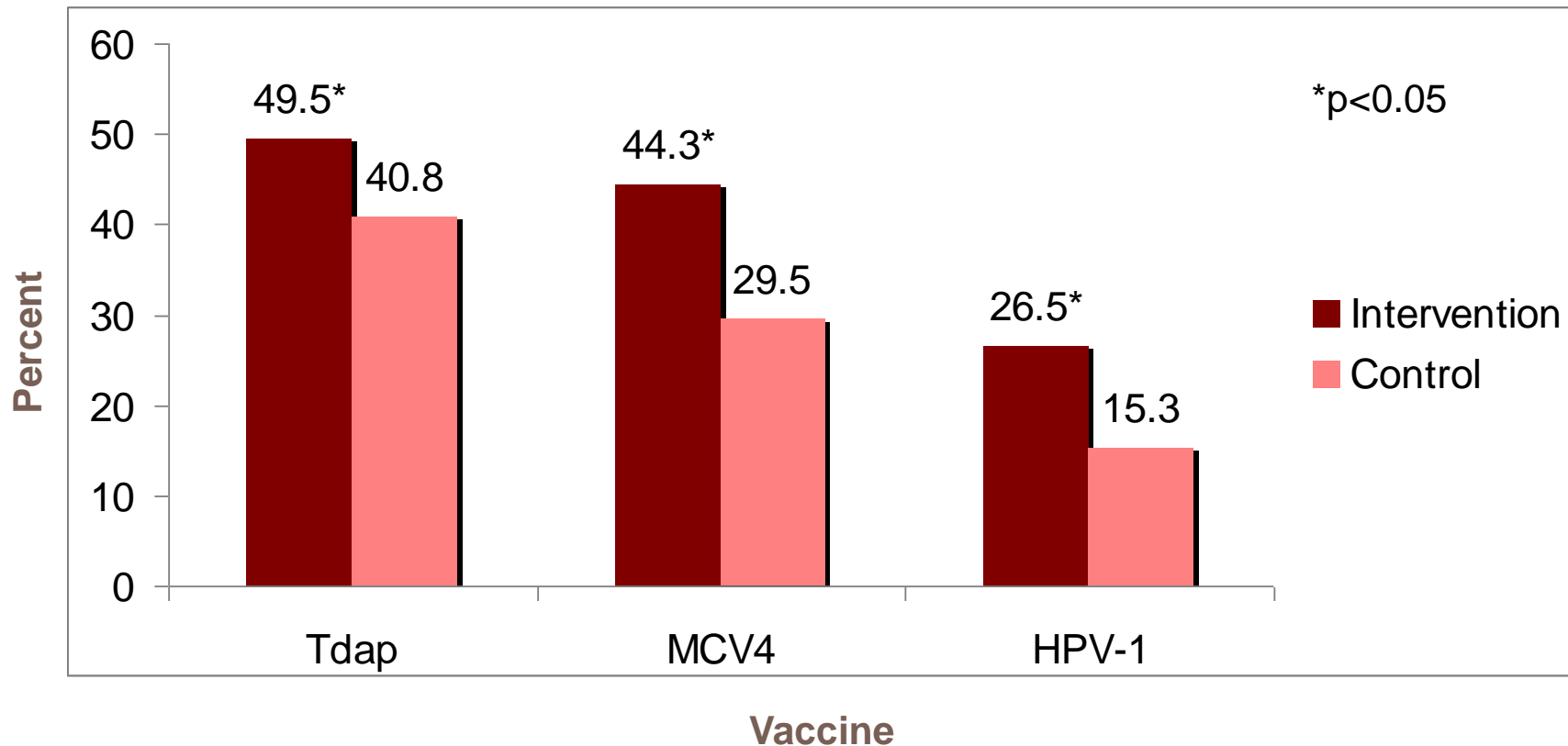
Standing Orders for Administering Vaccines

Storage and Handling

Eligible health professionals may vaccinate adults who meet any of the criteria on this form
[#P3077, 6/13]

[Preview of handout](#)

Impact of Reminder and Recall on Vaccination Rates among Adolescents



Reminders = Letter, 2 “robocalls”, letter

All Strategies May Not Be Successful...

[Accad Pediatr.](#) 2015 Mar-Apr;15(2):149–57. doi: 10.1016/j.acap.2014.10.006.

Effect of provider prompts on adolescent immunization rates: a randomized trial. [Szilagyi PG](#)¹, [Serwint JR](#)², [Humiston SG](#)³, [Rand CM](#)⁴, [Schaffer S](#)⁴, [Vincelli P](#)⁴, [Dhepyasuwan N](#)⁵, [Blumkin A](#)⁴, [Albertin C](#)⁴, [Curtis CR](#)⁶.

Abstract

OBJECTIVE:

Adolescent immunization rates are suboptimal. Experts recommend provider prompts at health care visits to improve rates. We assessed the impact of either electronic health record (EHR) or nurse- or staff-initiated provider prompts on adolescent immunization rates.

METHODS:

We conducted a randomized controlled trial, allocating practices in 1 of 2 practice-based research networks (PBRN) to provider prompts or standard-of-care control. Ten primary care practices participated, 5 intervention and 5 controls, each matched in pairs on urban, suburban, or rural location and practice type (pediatric or family medicine), from a PBRN in Greater Rochester, New York (GR-PBRN); and 12 practices, 6 intervention, 6 controls, similarly matched, from a national pediatric continuity clinic PBRN (CORNET). The study period was 1 year per practice, ranging from June 2011 to January 2013. Study participants were adolescents 11 to 17 years attending these 22 practices; random sample of chart reviews per practice for baseline and postintervention year to assess immunization rates (n = 7,040 total chart reviews for adolescents with >1 visit in a period). The intervention was an EHR prompt (4 GR-PBRN and 5 CORNET practice pairs) (alert) that appeared on providers' computer screens at all office visits, indicating the specific immunizations that adolescents were recommended to receive. Staff prompts (1 GR-PBRN pair and 1 CORNET pair) in the form of a reminder sheet was placed on the provider's desk in the exam room indicating the vaccines due. We compared immunization rates, stratified by PBRN, for routine vaccines (meningococcus, pertussis, human papillomavirus, influenza) at study beginning and end.

RESULTS:

Intervention and control practices within each PBRN were similar at baseline for demographics and immunization rates. Immunization rates at the study end for adolescents who were behind on immunizations at study initiation were not significantly different for intervention versus control practices for any vaccine or combination of vaccines. Results were similar for each PBRN and also when only EHR-based prompts was assessed. For example, at study end, 3-dose human papillomavirus vaccination rates for GR-PBRN intervention versus control practices were 51% versus 53% (adjusted odds ratio 0.96; 95% confidence interval 0.64–1.34); CORNET intervention versus control rates were 50% versus 42% (adjusted odds ratio 1.06; 95% confidence interval 0.68–1.88).

CONCLUSIONS AND RELEVANCE:

In both a local and national setting, provider prompts failed to improve adolescent immunization rates. More rigorous practice-based changes are needed.

AFIX (Assessment, Feedback, Incentives, and eXchange)

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Overview of AFIX

AFIX is a quality improvement program used by awardees to raise immunization coverage levels, reduce missed opportunities to vaccinate, and improve standards of practices at the provider level. The acronym for this four-part dynamic strategy stands for

1. **Assessment** of the healthcare provider's vaccination coverage levels and immunization practices.
2. **Feedback** of results to the provider along with recommended quality improvement strategies to improve processes, immunization practices, and coverage levels.
3. **Incentives** to recognize and reward improved performance.
4. **eXchange** of information with providers to follow up on their progress towards quality improvement in immunization services and improvement in immunization coverage levels.



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What's New!

- Quarterly Conference Call Minutes
March 26, 2015
- AFIX Policies and Procedures Guide
- AFIX Site Visit Questionnaire
- AFIX Site Visit Answer Guide

Summary

- HPV, Tdap, and mening vax
- We've got to get rates up to the max
- With policies in place
- Providers in the race
- We'll stop teen diseases in their tracks.